

# *Huperzia tetrastichoides* A.R.Field & Bostock (Lycopodiaceae) a newly recognised species of tassel fern from the Wet Tropics of Queensland, Australia

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## Summary

Field, A.R. & Bostock, P.D. (2008). *Huperzia tetrastichoides* A.R.Field & Bostock (Lycopodiaceae), a newly recognised species of tassel fern from the Wet Tropics of Queensland, Australia. *Austrobaileya* 7(4): 711–715. An Australian endemic species of tassel fern *Huperzia tetrastichoides* A.R.Field and Bostock is described as new. This species was previously confused with the non-Australian species *Huperzia prolifera* (Blume) Trevis. The new species is restricted to upland Queensland rainforests from the Windsor Tableland south to the Clarke Range west of Mackay. It is listed as Vulnerable under the *Queensland Nature Conservation Act 1992*. A dichotomous identification key to the Australian species of *Huperzia* is provided.

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## Introduction

*Huperzia* Bernh. is the largest genus of the Lycopodiaceae, an ancient and cosmopolitan plant family (Ollgaard 1987). Twelve species of *Huperzia* have been recorded in Australia (Bostock & Holland 2007). Ten of these species are epiphytic or epilithic in rainforests in the Queensland tropics (Chinnock 1998). Following examination of living plants and herbarium specimens from Asia and Australia we have concluded that the entity hitherto recognised as *Huperzia prolifera* (Blume) Trevis. (*sensu* Andrews 1990; Chinnock 1998; Goodger *et al.* 2008) in Australia is not conspecific with that Malesian species (Blume 1828) (photos of lectotype sheets at Leiden L0057380 and L0057381 seen). It is described in this paper as a new species and considered to be endemic to Australia.

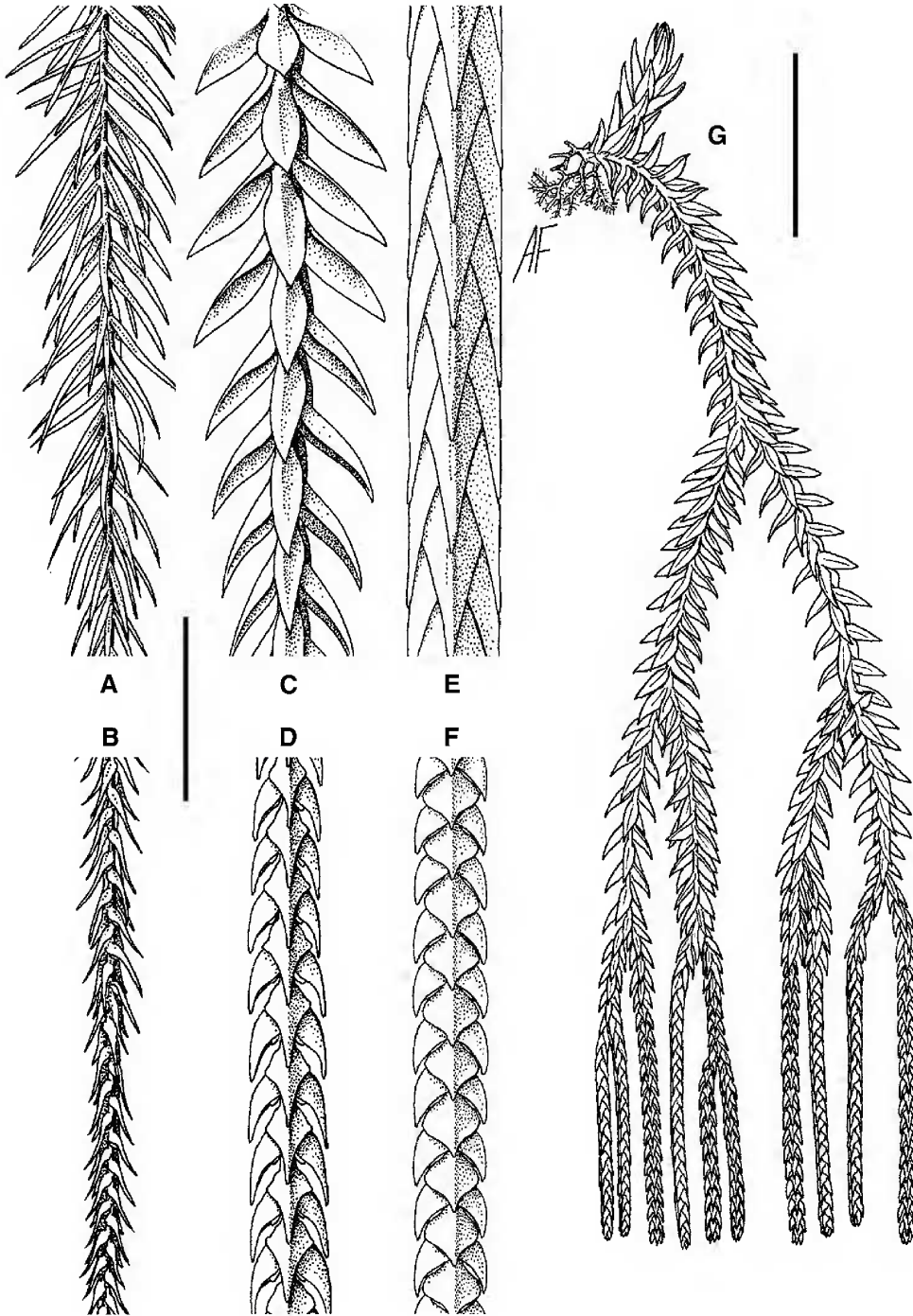
## Materials and methods

This study is based on field observations and collections in north Queensland and Malaysia, together with examination of herbarium collections at BRI, CANB and CNS (formerly QRS).

## Taxonomy

***Huperzia tetrastichoides*** A.R.Field & Bostock, **species nova** antea *H. prolifera* confusa, a qua microphyllis triangulari-ovatis, carinatis et orthostichis in seriebus quatuor (non lineari-lanceolatis, ut minimum lycophyllis planis et microphyllis omnibus heterostichis) differt; ad *H. tetrasticham* arctissime accedit, a qua lycophyllis ad angulum 20–50° patentibus non aequaliter adpressis et imbricatis differt. **Typus:** Queensland. COOK DISTRICT: Millaa Millaa Falls, Atherton Tableland, 14 June 2004, *A.R.Field and O.Rawlins 1139* (holo: BRI; iso: CNS, distribuendi).

**Sporophyte:** Epiphytic herbaceous plant with indeterminate isodichotomous pendulous shoots arising from a tufted root system. Lycophylls and sporophylls subopposite, decussate, orthostichous in four rows. Lycophylls triangular-ovate, carinate, thin but firm, 5–12 mm long, 2–6 mm wide, in basal sterile divisions diverging 20°–50° from stem, gradually transforming to adpressed, imbricate sporophylls in sharply quadrangular terminal fertile divisions. Sporophylls triangular, carinate, thin but firm, 4–6 mm



**Fig. 1.** *Huperzia prolifera*. A. infertile shoot section and B. fertile shoot section; *Huperzia tetrastichoides*. C. infertile shoot section and D. fertile shoot section; *Huperzia tetrasticha*. E. infertile shoot section and F. fertile shoot section ; A–F scale bar = 2 cm; *Huperzia tetrastichoides*. G. habit showing isodichotomous pendant branching, carinate sterile lycophylls and sporophylls, lycophylls arranged in four rows and quadrangular strobili; G scale bar = 5 cm. A & B from scan of L57380 and L57381; C & D, G from *Field ARF1139* (BRI); E & F from *Field ARF0815* (BRI). Del. A. Field.

long, c. 3 mm wide at base. Sporangia c. 2 mm in diameter, each completely concealed by its subtending sporophyll. Stems pale green, lycophylls and sporophylls usually dull dark green. **Gametophyte:** unknown.

**Additional specimens examined [precise localities withheld]: Queensland.** COOK DISTRICT: Mossman, May 2004, *Field ARF723, Lloyd & Toh* (BRI); NW of Julatten, May 1989, *Jones 4266 & Clements* (BRI, CANB); Rumula, Oct 2004, *Field & Field ARF826* (BRI); Black Mt, Jul 1999, *Jago 5307, Wannan & Worboys* (BRI). NORTH KENNEDY DISTRICT: Koombuloomba, Feb 2003, *Gray 8439* (CANB); Paluma, Apr 2003, *Field ARF613 & Cairns* (BRI). SOUTH KENNEDY DISTRICT: Eungella, Jan 1994, *Pollock 127 & Pearson* (BRI); Eungella, Feb 2005, *Field ARF888 & Field* (BRI); Crediton, Jun 2001, *Ford AF2871* (BRI, QRS).

**Distribution and habitat:** *Huperzia tetrastichoides* is an uncommon canopy epiphyte of upland notophyll vineforest from Mt Finnigan at c. 15°50'S, south to the Clarke Range west of Mackay at c. 21°S (**Map 1**). It is most prevalent on the Evelyn, Atherton and Mt Carbine Tablelands and descends to lower altitudes in Mossman Gorge. No specimens have been recorded from outside Australia thus it is considered endemic to the Wet Tropics of Queensland.

**Notes:** *Huperzia tetrastichoides* has carinate, triangular to ovate microphylls that are orthostichous in four rows, whereas *H. prolifera* has mostly flat, linear to lanceolate,

heterostichous microphylls (**Fig. 1A–B, G**). *Huperzia tetrastichoides* resembles the Malesian species *Huperzia tetrasticha* (**Fig. 1E–F**) but differs from it by having divergent rather than uniformly adpressed, imbricate lycophylls (**Fig. 1C–D**). *Huperzia tetrastichoides* resembles the endemic Australian species *Huperzia marsupiiiformis* (D.L.Jones & B.Gray) Holub and *Huperzia lockyeri* (D.L.Jones & B.Gray) Holub. It differs from *Huperzia marsupiiiformis* by having carinate, triangular-ovate, acutely pointed lycophylls rather than flat, oval, blunt lycophylls and from *H. lockyeri* by having carinate not flat lycophylls and by strobili that are quadrangular throughout rather than terete in some parts.

**Conservation status:** Currently listed as vulnerable under the Queensland *Nature Conservation Act* 1992.

**Etymology:** The specific epithet reflects the similarity of this species to *Huperzia tetrasticha*; it is formed from the epithet *tetrasticha* based on the Latin *tetra*, four of, and *stichos*, a row or line of things, and the suffix *-oides*, like or resembling.

**Common name:** This species is commonly known as the 'bootlace tassel fern' or the 'Queensland square tassel fern' in the nursery trade.

### Key to Australian *Huperzia*

- |    |   |                          |
|----|---|--------------------------|
| 1  | Plants with erect fertile shoots . . . . .                          | 2                        |
| 1. | Plants with pendant or nodding fertile shoots . . . . .             | 3                        |
| 2  | Lycophylls entire; bulbils present in lycophyll axils . . . . .     | <b>H. australiana</b>    |
| 2. | Lycophylls serrate; bulbils lacking . . . . .                       | <b>H. serrata</b>        |
| 3  | Shoots homophyllous; sporophylls spreading widely . . . . .         | 4                        |
| 3. | Shoots heterophyllous; sporophylls adpressed . . . . .              | 5                        |
| 4  | Shoots glaucous blue grey; lycophylls lanceolate . . . . .          | <b>H. dalhousieana</b>   |
| 4. | Shoots glossy green; lycophylls linear-lanceolate . . . . .         | <b>H. squarrosa</b>      |
| 5  | Strobili 1–2 mm thick . . . . .                                     | 6                        |
| 5. | Strobili 3–5 mm thick . . . . .                                     | 7                        |
| 6  | Lycophylls sessile, decurrent in four distinct rows . . . . .       | <b>H. phlegmarioides</b> |
| 6. | Lycophylls petiolate, not decurrent in four distinct rows . . . . . | <b>H. phlegmaria</b>     |

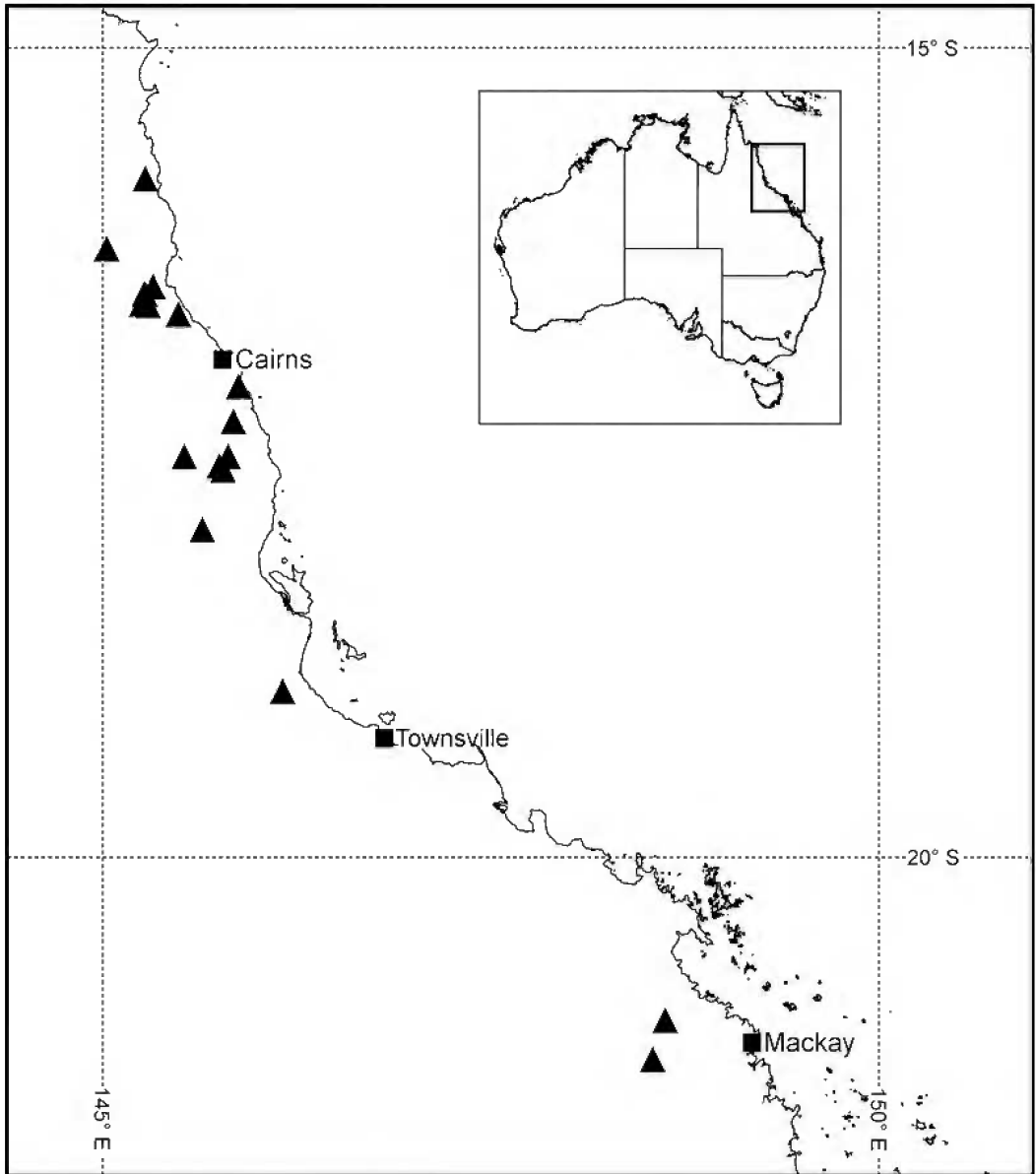
- 7 Lycophylls thin and linear, margins minutely serrate . . . . . **H. filiformis**
7. Lycophylls lanceolate to ovate, margins entire . . . . . 8
- 8 Lycophylls carinate or cupped in cross section. . . . . 9
8. Lycophylls flat in cross section . . . . . 10
- 9 Basal lycophylls triangular-ovate, arranged in four rows; lycophylls and sporophylls thin and coriaceous . . . . . **H. tetrastichoides**
9. Basal lycophylls lanceolate, arranged in more than four rows; lycophylls and sporophylls thick and succulent . . . . . **H. carinata**
- 10 Lycophylls with obtuse apices . . . . . **H. marsupiiformis**
10. Lycophylls with acute apices . . . . . 11
- 11 Sporophyll apices attenuate and spreading; stems fleshy. . . . . **H. lockyeri**
11. Sporophyll apices obtuse to acute and recurved; stems woody . . . . . **H. varia**

### Acknowledgments

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Map 1. Distribution of *Huperzia tetrastichoides* ▲.